

High Current, High Frequency, Power Inductors

Flat-Pac™ FP1007R6 Series



Description

- Halogen free, lead free, RoHS compliant
- 125°C Maximum total temperature operation
- 10.5 x 8.0 x 7.0mm Maximum surface mount package
- Ferrite core material
- Controlled DCR tolerance for sensing circuits
- Inductance Range from 150nH to 470nH
- Current range from 23.5 to 75 Amps
- Frequency range up to 2MHz

Applications

- Multi-phase regulators
- Voltage Regulator Modules (VRMs)
- Desktop and server VRMs and EVRDs
- Notebook regulators
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-Load modules
- DCR Sensing

Environmental Data

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (ambient + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Packaging

- Supplied in tape-and-reel packaging, 700 parts per 13 inch diameter reel

Product Specifications							
Part Number ⁷	OCL ¹ ±10% (nH)	FLL ² Min. (nH)	I _{rms} ³ (Amps)	I _{sat} ¹⁴ @25°C (Amps)	I _{sat} ²⁵ @100°C (Amps)	DCR @20°C (mΩ)	K-Factor ⁶
FP1007R6-R15-R	150	108	61	75.0	60.0	0.29 ± 5%	348.8
FP1007R6-R18-R	180	129		60.0	50.0		
FP1007R6-R22-R	220	158		50.0	40.0		
FP1007R6-R27-R	270	194		41.0	33.0		
FP1007R6-R33-R	330	237		33.0	26.5		
FP1007R6-R39-R	390	280		28.0	22.5		
FP1007R6-R47-R	470	338		23.5	19.0		

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V_{rms}, 0.0A_{dc}

2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V_{rms}, I_{sat}1

3. I_{rms}: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed 125°C under worst case operating conditions verified in the end application.

4. I_{sat}1: Peak current for approximately 20% rolloff at +25°C.

5. I_{sat}2: Peak current for approximately 20% rolloff at +100°C.

6. K-factor: Used to determine B_{p-p} for core loss (see graph).
 $B_{p-p} = K * L * \Delta I * 10^{-3}$. B_{p-p}:(Gauss), K: (K-factor from table),
 L: (Inductance in nH), ΔI (peak-to-peak ripple current in Amps).

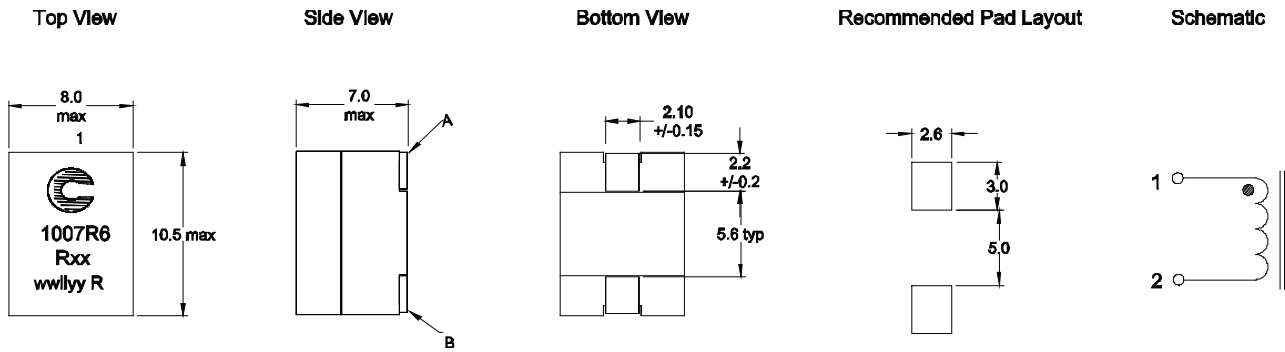
7. Part Number Definition: FP1007R6-Rxx-R

FP1007R6 = Product code and size

Rxx= Inductance value in uH, R = decimal point

-R suffix = RoHS compliant

Dimensions - mm



The nominal DCR is measured from point "A" to point "B"

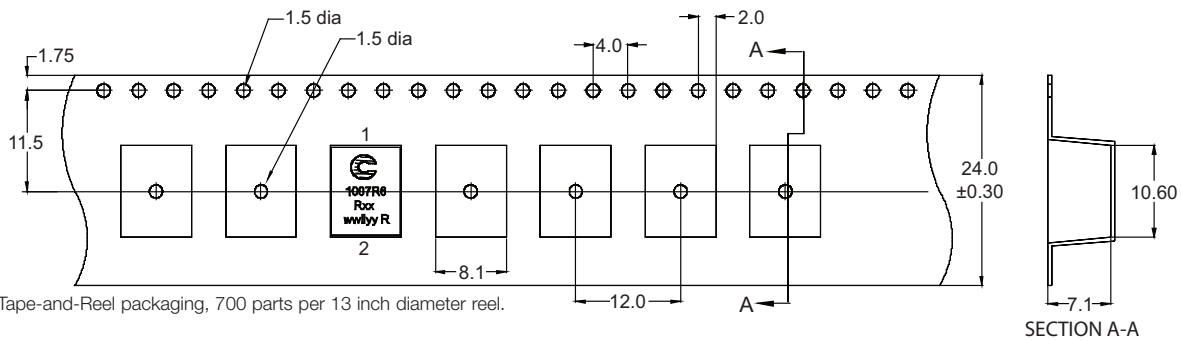
Part Marking: Coiltronics Logo, 1007R6, Rxx = Inductance value in μH . (R = Decimal point) wwlyy = Date code R = Revision level

Tolerance are $\pm 0.15\text{mm}$ unless otherwise specified.

Soldering surfaces to be coplanar within 0.1016mm.

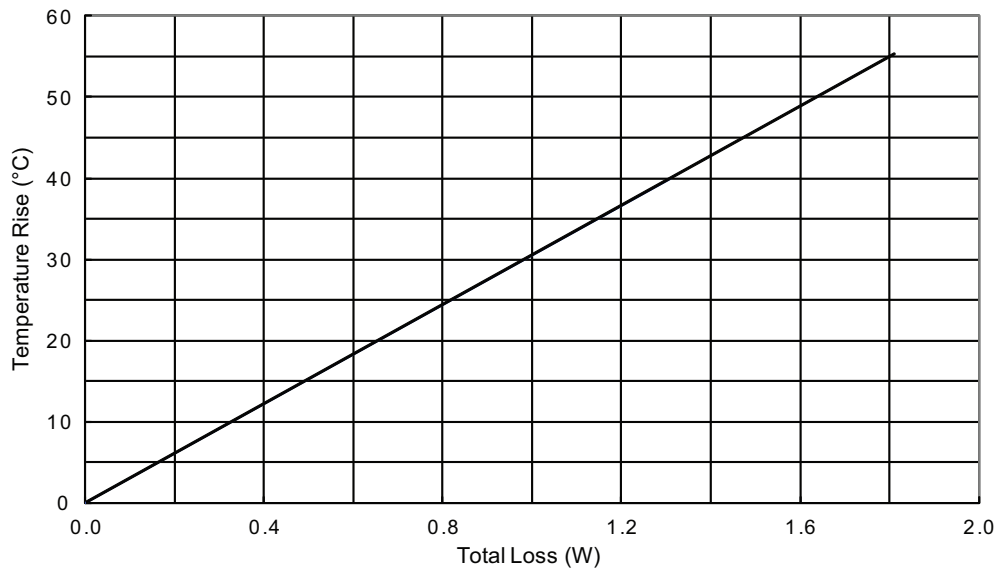
PCB tolerance $\pm 0.1\text{mm}$ unless otherwise specified.

Packaging Information - mm

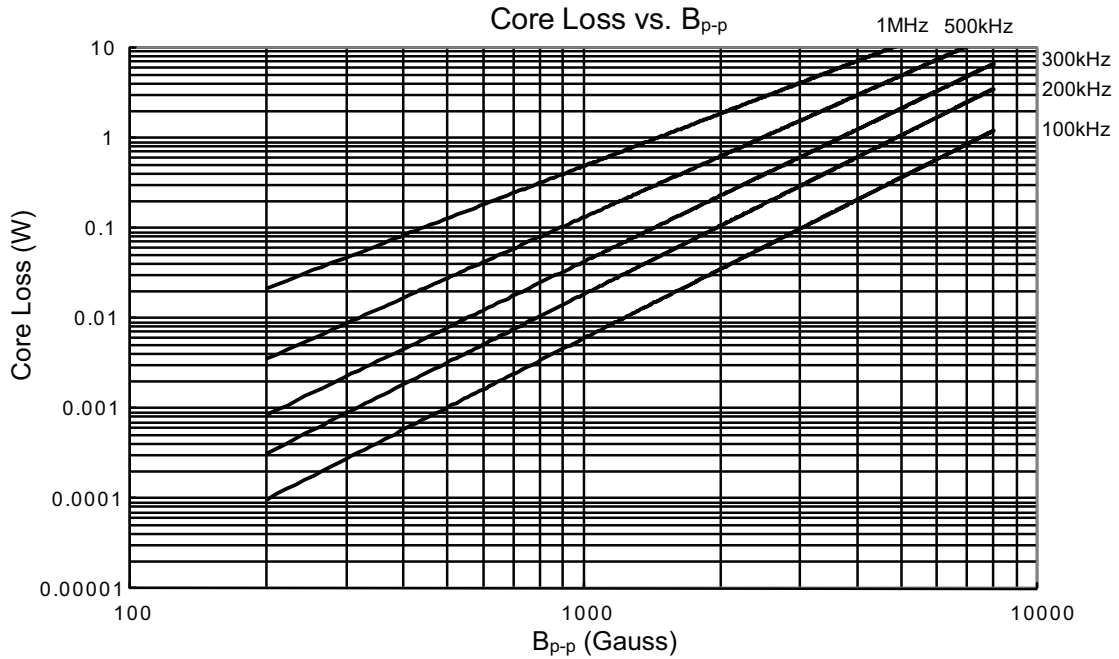


Supplied in Tape-and-Reel packaging, 700 parts per 13 inch diameter reel.

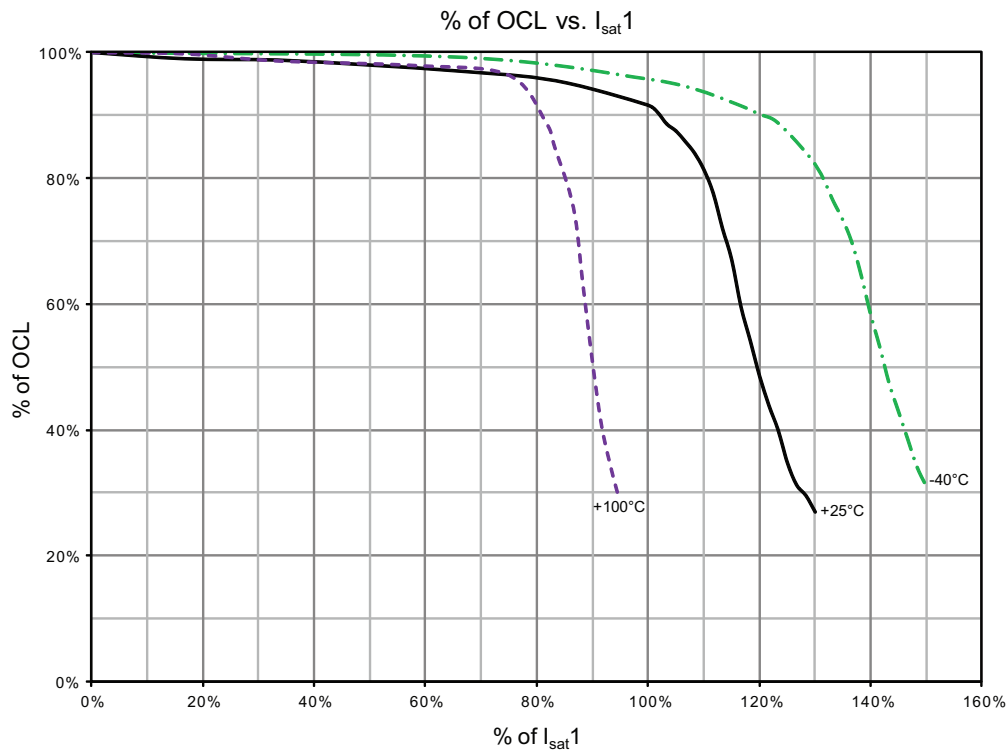
Temperature Rise vs. Total Loss



Core Loss



Inductance Characteristics



Solder Reflow Profile

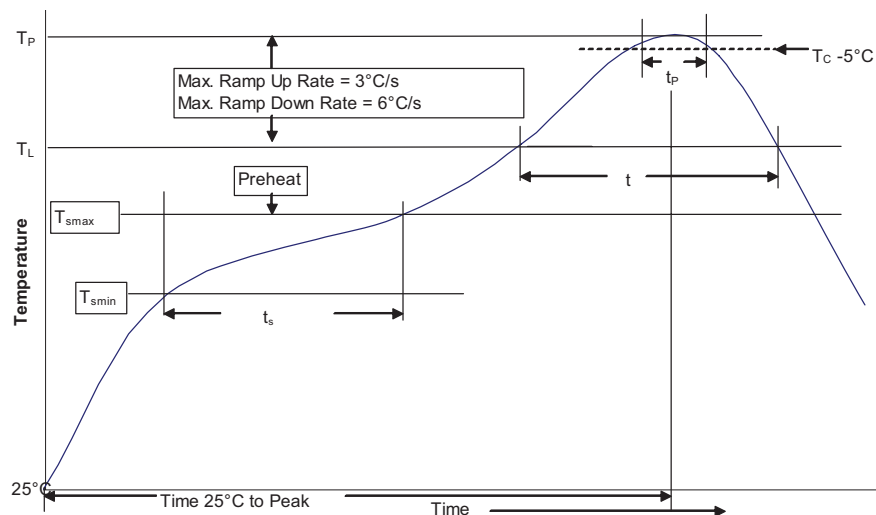


Table 1 - Standard SnPb Solder (T_c)

Package Thickness	Volume mm^3 <350	Volume mm^3 \geq 350
<2.5mm	235°C	220°C
\geq 2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T_c)

Package Thickness	Volume mm^3 <350	Volume mm^3 350 - 2000	Volume mm^3 >2000
<1.6mm	260°C	260°C	260°C
1.6 – 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Reference JDEC J-STD-020D

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak		
• Temperature min. (T_{smin})	100°C	150°C
• Temperature max. (T_{smax})	150°C	200°C
• Time (T_{smin} to T_{smax}) (t_s)	60-120 Seconds	60-120 Seconds
Average ramp up rate T_{smax} to T_p	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_l)	60-150 Seconds	60-150 Seconds
Peak package body temperature (T_p)*	Table 1	Table 2
Time (t_p)** within 5 °C of the specified classification temperature (T_c)	20 Seconds**	30 Seconds**
Average ramp-down rate (T_p to T_{smax})	6°C/ Second Max.	6°C/ Second Max.
Time 25°C to Peak Temperature	6 Minutes Max.	8 Minutes Max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

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